IN THE CLAIMS:

1. (Canceled)

2. (Currently Amended) A method for receiving and decoding signals in a multicarrier transmission system comprising the steps of:

receiving, from each of a plurality of antennas, a multicarrier signal corresponding to a transmitted multicarrier signal;

applying a Fast Fourier transformation to each of said received multicarrier signals to form respective transformed multicarrier signals;

estimating characteristics of a channel over which said transmitted multicarrier signal passed to said antennas using iterative forward processing; and

decoding said transformed multicarrier signal,

~~The method according to claim 1,~~ wherein said iterative forward processing includes ~~comprises~~ the steps of:

accepting a transformed block of a frame from each of said transformed multicarrier signals, said transformed block having an associated block number that indicates ordinal position of said block in said frame;

determining whether said transformed blocks accepted from transformed multicarrier signals, corresponds to a transmitted training block;

if said accepted transformed blocks correspond to said transmitted training block,

(a) calculating a tentative reference signal from said accepted transformed blocks;

(b) generating a tentative estimation of channel characteristics using said tentative reference signal;

(c) incrementing said block number;

(d) returning to said step accepting if said block number indicates that an end of said frame has not been reached;

if said accepted transformed blocks do not correspond to said [[a]] training block,

(~~f~~) decoding said accepted transformed blocks [[of]];

(~~g~~) re-calculating said reference signal based on said accepted transformed blocks and results of said ~~decoding~~;

~~(h)~~ re-generating said estimation of channel characteristics, using the tentative reference signal re-calculated in step ~~(g)~~;

~~(i)~~ re-decoding said accepted transformed blocks using the estimation of channel characteristics re-generated in step ~~(h)~~; and

~~(j)~~ returning to step (a).

~~3.~~ **(Previously Presented)** The method according to claim ~~2~~, wherein said decoding and re-decoding ~~steps~~ are performed using $\hat{\mathbf{c}}_n = \arg\min_{\mathbf{c}_n} \sum_m \|\mathbf{x}_{m,n} - \hat{\mathbf{H}}_{m,n}\mathbf{c}_n\|^2$,

where $\mathbf{x}_{m,n}$ is the transformed block, $\hat{\mathbf{H}}_{m,n}$ is said estimation of channel characteristics, $\mathbf{c}_n$ is a vector of known result values, and $\hat{\mathbf{c}}_n$ is a vector of the decoded results.

4. (Canceled).

5. (Canceled).

6. (Canceled).

7. (Canceled).

8. (Canceled).

9. (Canceled).

10. (Canceled).

11. (Canceled).

12. (Canceled).

13. (Canceled).

14. (Canceled).

15. (Canceled).

~~16.~~ **(Currently Amended)** A method for estimating channel characteristics in a multicarrier transmission system comprising the steps of:

receiving, from each of a plurality of receiving ports, a sequence of multicarrier signal blocks of a transmitted frame containing ~~a plurality of~~ N blocks, where each received block has an associated block number, *k*, that designates an ordinal position of said block in said frame;

processing received blocks of said frame having block number N ~~(blocks N)~~ by:

(a) setting value of *k* to N;

(b) applying~~, to said blocks N~~ a Fast Fourier transformation[[s]] to block *k* to form transformed block~~s N~~ *k*; and

(c) performing ~~determining information contained in said transformed blocks N using iterative~~ backward processing~~, wherein said iterative backward processing comprises the steps of;~~ by:

tentatively decoding said transformed block~~s N~~ *k*;

calculating a tentative reference signal based on a previously processed blocks that correspond to a transmitted training block;

generating a tentative estimation of channel characteristics using said tentative reference signal;

re-decoding said transformed block~~s N~~ *k*;

calculating a reference signal based on said re-decoded transformed block~~s N~~ *k*;

generating an estimation of channel characteristics using said reference signal;

decrementing value of the block number ~~N~~;

determining whether the decremented value ~~of N~~ corresponds to the beginning of said frame; and

returning to said step of performing backward processing when ~~N~~ the decremented value does not correspond to the beginning of said frame..

17. (Canceled).

18. (Canceled).

19. (Canceled).

20. (Canceled).

~~21~~ 5. (Currently Amended) The method according to claim ~~16~~ 3, wherein said tentatively decoding and said re-decoding each employs a combined signal developed ~~with~~ by:

demodulating said transformed blocks ~~N~~ k to form demodulated signals;

combining said demodulated signals using a maximum ratio combiner to form said combined signal; and

Viterbi decoding said combined signal.

~~22.~~ 6 **(Original)** The method according to claim ~~21~~ 5, further comprising the step of deinterleaving said combined signal if said combined signal was interleaved for transmission.

23. (Canceled).

~~24.~~ 7 **(Currently Amended)** The method according to claim ~~21~~ 5, wherein said demodulating step is performed substantially concurrently on said transformed blocks ~~N~~ k.

25. (Canceled).

~~26.~~ 4 **(Previously Presented)** The method according to claim ~~16~~ 3, wherein Fast Fourier transformations are applied to each of said sequences received from the receiving ports.

27. (Canceled).

28. (Canceled).

29. (Canceled).

30. (Canceled).

31. (Canceled).

32. (Canceled).

33. (Canceled).

34. (Canceled).

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~~35.~~ **(Previously Presented)** The method according to claim ~~21~~, wherein said demodulating step is performed using QPSK demodulating techniques.

36. (Canceled).